

Transportation Policy for Shipments of Colorado Plateau Uranium Ores to the White Mesa Uranium Mill

Purpose:

The purpose of this policy is to describe the shipping responsibilities and practices to be employed when shipping uranium ore from a Colorado Plateau mine (the “Mine”) by truck to the White Mesa Uranium Mill (the “Mill”). The policy outlines specific shipping precautions and necessary documentation to maintain compliance with applicable requirements of the U.S. Department of Transportation (“DOT”) regulations at Title 49 of the Code of Federal Regulations. Safe transportation of uranium ore from the Mine to the Mill is paramount to Denison Mines (USA) Corp. (“DUSA”), and strict adherence to this policy is required.

Scope:

This policy encompasses uranium ore shipping and transportation requirements and the specific responsibilities of the Mine operator/owner, the transport contractor (the “Transportation Contractor”) and Mill personnel with regard to: maintaining exclusive use shipments, personnel training, vehicle marking, preparation of shipping papers, transportation requirements, emergency response, radiation control, record retention and other matters.

Policy

1. Summary of Responsibilities

1.1. Mine Operator/Owner Responsibilities

The Mine operator/owner will be responsible for:

- Providing training to Mine operator/owner and/or Transportation Contractor personnel relating to the appropriate safe handling practices specific to uranium ores during loading, transport and unloading operations (see Section 3.1.2).
- Ensuring that the required shipping papers are completed, signed, and delivered to the transport driver (see Section 5).
- Verifying that ore shipments from the Mine are not A₂ quantities of Class 7 radioactive material and hence not subject to certain marking and labeling requirements (see Section 2).
- Ensuring that gamma and removable contamination limits for ore shipments from the Mine are satisfied (see Sections 8.2 and 8.3).

1.2. Transportation Contractor Responsibilities

Transportation contractor personnel will be responsible for:

- Providing appropriate vehicle markings (see Section 4).

- Transporting uranium ore to the Mill in accordance with Section 6 below.
- Unloading transported uranium ore at the Mill.
- Maintaining exclusive (sole) use of the transport vehicle for uranium ore shipment and providing a closed conveyance trailer while shipping uranium ore to the Mill (see Sections 2 and 6.1).
- Carrying and delivering to the Mill a copy of the shipping papers which will accompany the uranium ore shipment (see Section 5).
- Ensuring that the training requirements described in Section 3.1.1 are satisfied.
- Preparing and adhering to an Emergency Response Plan (see Section 7).
- Contacting DUSA personnel listed on the shipping documents and providing emergency response and cleanup personnel should accidental spillage of uranium ore occur during transport to the Mill (see Section 7).
- Requesting an unrestricted use release survey from Mill radiation safety personnel when the transport vehicle is planned for uses other than uranium ore haulage (see Section 8.3.2).

1.3. DUSA Responsibilities

DUSA personnel will be responsible for:

- Assisting in emergency response situations if accidental spillage of uranium ore during transport has occurred (see Section 7).
- Completing radiation surveys of the transport vehicles prior to return to service for unrestricted use and shipment of commodities other than uranium ore (see Section 8).
- Signing and retaining all shipping and survey records pertaining to shipments of uranium ore (see Sections 5 and 9).

2. **Classification of Ore and Exclusive Use Shipments**

The Colorado Plateau uranium ore that will be shipped from the Mine to the Mill is classified as Class 7 Radioactive LSA-I “hazardous material” under 49 CFR 171.8. However, shipments of 32 tons or less per trailer will generally not constitute an A₂ quantity of any Class 7 radioactive material, within the meaning of 49 CFR 173.403, due to the relatively low specific activity of the uranium ore. This means that the shipments will generally be exempt from most of the marking and labeling requirements (see Section 2(e)). It is the responsibility of the Mine operator/owner to ensure that ore shipments from the Mine are not A₂ quantities of Class 7 radioactive material. An A₂ quantity means that the activity from Unat or from any of its daughters in any ore shipment exceeds the activity level set out in the table in 49 CFR 173.435.

Although the Colorado Plateau uranium ore will generally not on average have a high enough specific activity level to constitute a “hazardous substance” under 49 CFR 171.8, DUSA has concluded that it is nevertheless prudent that shipping papers and an emergency response plan, normally required only for shipments of hazardous substances under 49 CFR 177.200, 177.817 and 172.600, be required for each load of uranium ore (see Sections 5 and 7 below).

The uranium ore will be consigned as exclusive use shipments of uranium ore in accordance with the provisions of 49 CFR 173.427(a)(6) and will be shipped unpackaged in accordance with the provisions of 49 CFR 173.427(c). Accordingly,

- a) Shipments must be loaded by the Mine operator/owner or the Transportation Contractor at the Mine and unloaded by the Transportation Contractor at the Mill, in accordance with directions from Mill personnel, from the truck trailer in which it was originally loaded;
- b) The Transportation Contractor must ensure that there is not any leakage of uranium ore from the truck trailer;
- c) Specific instructions for maintenance of exclusive use shipment controls will be provided by the Mine operator/owner to the Transportation Contractor with the shipping paper information (see Section 5.2 below);
- d) Because the shipments will be of uranium ore, the transport vehicle is not required to be placarded (see 49 CFR 173.427(a)(6)(v)); and
- e) Because shipments of Colorado Plateau uranium ores of 32 tons or less will generally contain less than an A₂ quantity of any Class 7 Radioactive material, the shipments are generally exempted from the marking and labeling requirements set out in 49 CFR 172 Subparts D and E (see 49 CFR 173.427(a)(6)(vi)), provided that the trailers are marked "RADIOACTIVE-LSA" in accordance with Section 4(a) below. It is the responsibility of the Mine operator/owner to ensure that each shipment of ore from the Mine contains less than an A₂ quantity of any Class 7 radioactive material.

3. Training Requirements

3.1. Shipment Personnel

3.1.1. Training Required to be Provided by the Transportation Contractor

In accordance with the requirements of 49 CFR 177.800 and 177.816, each truck driver and any other Transportation Contractor personnel involved in the loading or unloading of uranium ore onto and from the uranium ore truck must be trained in the applicable requirements of 49 CFR parts 390 through 397 and the procedures necessary for the safe operation of the vehicle. Driver training must include the following subjects:

- a) Pre-trip safety inspection;
- b) Use of vehicle controls and equipment, including operation of emergency equipment;
- c) Operation of vehicle, including turning, backing, braking, parking, handling, and vehicle characteristics including those that affect vehicle stability, such as effects of braking and curves, effects of speed on vehicle control, dangers associated with maneuvering through

curves, dangers associated with weather or road conditions that a driver may experience (e.g., blizzards mountainous terrain, high winds), and high center of gravity;

- d) Procedures for maneuvering tunnels, bridges, and railroad crossings;
- e) Requirements pertaining to attendance of vehicles, parking, smoking, routing, and incident reporting; and loading and unloading of materials.

This training is the responsibility of the Transportation Contractor and may be satisfied by compliance with the current requirements of a Commercial Driver's License with a hazardous materials endorsement.

3.1.2. Additional Training to be Given by the Mine Operator/Owner

It is the responsibility of the Mine operator/owner to ensure that Mine operator/owner and Transportation Contractor personnel involved in loading, transporting and unloading the consigned uranium ore shipment also receive additional specialized training relating to the appropriate safe handling practices specific to uranium ore shipments. A training record will be documented by the Mine operator/owner.

This training should include at a minimum the following radiation safety topics:

- a) basic radiation concepts (alpha, beta and gamma radiation);
- b) dust and contamination control measures necessary during loading, unloading and uranium ore shipment:
 - avoid inhalation during loading and unloading operations
 - tarpaulin covers and tailgate closure requirements (i.e. closed transport vehicle)
 - avoid spillage onto the vehicle during loading operations
 - avoid shipment during muddy mine site conditions;
- c) vehicle survey requirements to release vehicles for unrestricted use;
- d) exclusive use transport provisions; and
- e) emergency response contact information in the event of accidental uranium ore spillage during transport (who should be contacted at DUSA and what information should be conveyed).

4. Vehicle Marking

Each exclusive use transport conveyance (trailer) shall be marked as follows:

- a) The words “RADIOACTIVE LSA” must be stenciled or otherwise affixed to the surface or on a label, tag or sign in 3 inch letters in a conspicuous place on both sides of the trailer (see Section 2(e) above); and
- b) The words “FOR RADIOACTIVE MATERIALS USE ONLY” must be stenciled in 3 inch letters in a conspicuous place on both sides of the trailer (see Section 8.3.1(b) below).

Such markings must remain affixed to the trailer during the entire period of exclusive use, regardless of whether the vehicle is loaded with uranium ore or not. These markings can be removed from the transport trailer only after the vehicle has been surveyed for unrestricted release at the Mill, at which time the vehicle is free to ship commodities other than uranium ore. **VEHICLES SHALL NOT BE USED FOR THE SHIPMENT OF ANY OTHER MATERIALS UNLESS THEY HAVE BEEN SURVEYED FOR UNRESTRICTED RELEASE BY MILL RADIATION SAFETY STAFF.** Upon release of any vehicles for unrestricted use in accordance with the provisions of Section 8.3.2 below, Mill staff will remove or paint over such markings. However, prior to re-use for transporting uranium ore to the Mill, such markings must be re-affixed to the trailer by the Transportation Contractor.

5. Shipping Papers

5.1. Material Description & Shipment Information

Each uranium ore shipment must be accompanied with signed shipping papers that comply with the requirements of 49 CFR Part 172, and shall include, in the case of uranium ore from Colorado Plateau mines, the following information:

Exclusive Use Shipment

Date of Acceptance:	_____
Shipping Name:	Radioactive Material-LSA 1 (<i>non-fissile</i>)
Hazard Class:	Class 7
Identification Number:	UN 2912
Packaging:	Bulk-Unpackaged
Quantity:	_____ TBq (0.30 Ci)
Radionuclide(s):	U-Nat. and associated decay chain progeny
Form:	Solid (Unrefined Uranium Ore)
Transport Index:	_____
Emergency Response	
Telephone Number:	_____

The shipping papers will be prepared by the Mine owner or operator. The Transportation Contractor shall ensure that the shipping papers are readily available to, and recognizable by, authorities in the event of an accident or inspection, in accordance with the requirements of 49 CFR 177.817(e).

5.2. Exclusive Use Statement

The following exclusive use statement must be printed onto the shipping papers:

This shipment of uranium ore is being shipped as an exclusive (sole) use shipment. Accordingly, the contents of this shipment must be loaded at the Mine and unloaded at the White Mesa Mill, absent any unloading or additional loading prior to delivery at the Mill. The transportation conveyance trailer must be utilized only for uranium ore transport until such time that Mill personnel conduct a survey of the interior and exterior of the trailer and determine that the trailer can be released for unrestricted use. At such time that the trailer is released for unrestricted use, all markings related to the radioactive material shipment must be removed from the conveyance trailer.

5.3. Certification

The Mine owner or operator shall certify that the uranium ore is offered for transportation in accordance with the applicable DOT regulations by printing the following certification on the shipping papers:

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

This certification must be legibly signed by an employee of the Mine operator or owner.

6. Transportation Requirements

6.1. Vehicles to be Kept Closed at all Times

The trailers must be kept closed at all times, when containing uranium ore and when empty, by use of a tarpaulin or other suitable mechanism, other than loading and unloading (see Section 8.3.1(c) below).

6.2. Transportation Route

The Transportation Contractor shall advise DUSA of the route to be taken from the Mine to the Mill. It should be noted, however, that shipments of uranium ore are not a “highway route controlled quantity” within the meaning of 49 CFR 403 and the applicable provisions of Title 49.

6.3. No Unnecessary Delay in Movement of Shipments

As required by 49 CFR 177.800, all shipments of uranium ore to the Mill must be transported without unnecessary delay, from and including the time of commencement of loading of the uranium ore until its final unloading at the Mill.

6.4. Use of Safe Havens

If necessary in order to coordinate delivery times at the Mill, the Transportation Contractor may designate suitable safe havens for the temporary storage of transportation vehicles along the transportation route from the Mine to the Mill. The location and use of such safe havens will be subject to the approval of DUSA.

7. **Emergency Response**

Emergency response in the event of an accident resulting in the spillage of uranium ore (or other spillage during transport) is the contractual responsibility of the Transportation Contractor. DUSA's role in such incidents will be to provide technical support, if required, during the emergency situation and, if necessary, to verify that cleanup requirements have been met. In addition, DUSA must be contacted, at the telephone number listed on the Shipping Papers, as immediately as possible in order to coordinate any necessary reporting to regulatory agencies.

The Transportation Contractor shall prepare an Emergency Response Plan for transportation of the uranium ore to the Mill, in accordance with 49 CFR 172 Subpart G, and shall provide a copy of such plan to DUSA for review and approval.

It should be noted that typical uranium grades for Colorado Plateau uranium ores (0.25-0.30% U_3O_8) do not represent a "Reportable Quantity". As such, reporting of spills to the National Response Center is not generally required. However, the National Response Center must be notified as soon as practical but no later than 12 hours after the occurrence of an incident listed in 49 CFR 171.15, such as where the general public is evacuated for one hour or more; a major transportation artery or facility is closed or shut down for one hour or more or suspected radioactive contamination occurs. In addition, a written report must be filed by the Transportation Contractor in accordance with 49 CFR 171.16. These notification requirements, including contact information, shall be included in the Transportation Contractor's Emergency Response Plan.

8. **Radiation Control**

8.1. Gamma Radiation Survey (Transportation Index)

Based upon a typical uranium ore grade of 0.25-0.30 % U_3O_8 for Colorado Plateau uranium ores, the gamma exposure rate from the transport vehicle is expected to be less than 1 mrem/hr. As a result, the requirements of 49 CFR 173.427(a)(1) that the external dose rate may not exceed an external radiation level of 1,000 mrem/hr at 3 meters from the unshielded material, and the requirements of 49 CFR 173.427(a)(5) and 173.441 (a) that under conditions normally incident to transportation:

- the radiation level does not exceed 200 mrem/hr at any point on the external surface of the package; and
- the transport index does not exceed 10,

are expected to be satisfied in all cases. It is also expected that the average reading in the occupied space of each truck cab will not exceed the DOT limit of 2 mrem/hr, specified in 49 CFR 173.441(b)(4).

8.2. Gamma Radiation Survey (Transportation Index)

It is the responsibility of the Mine operator/owner to ensure that the radiation levels fall within the applicable limits summarized in Section 8.1 above. At a minimum, the Mine operator/owner will perform the following surveys at the Mine site on a representative number of uranium ore shipments from the Mine:

- a) A beta/gamma survey will be conducted at various locations on all sides of the transport vehicle to determine if the radiation level exceeds 200 mrem/hr at any point on the external surface of the vehicle;
- b) A gamma survey will be conducted at one meter from all sides of the transport trailer. The average reading in mrem/hr will be recorded as the Transport Index for all uranium ore shipments from the Mine; and
- c) A gamma survey will be conducted within the cab of the transport tractor. The average reading in mrem/hr will be recorded to verify that the occupied space will not exceed the 2 mrem/hr limit.

These surveys will be recorded and kept on file.

In addition, the Mine operator/owner will perform (and document for the record) spot gamma surveys on uranium ore shipments from time to time as it deems appropriate in order to ensure that the regulatory standards are satisfied.

8.3. Removable Contamination Surveys

8.3.1. Vehicles Used Solely for Purposes of Transporting Ore from the Mine to the Mill.

49 CFR 177.843 provides that routine surface contamination surveys are not required at the Mine site or at the Mill for any vehicle used solely for transporting bulk-unpackaged uranium ore from the Mine to the Mill provided that:

- a) a survey of the interior surface of the conveyance trailer (when empty) shows that the radiation dose rate does not exceed 10 mrem/hr on contact or 2 mrem/hr at 1 meter from the interior surface. Since the conveyance, when filled with uranium ore is not expected to exceed 2mrem/hr on contact, a surveyed dose rate from the interior surface (or any other point on an empty trailer) should not exceed these limitations;
- b) the vehicles are stenciled with the words "FOR RADIOACTIVE MATERIALS USE ONLY" as described under Section 4(b) above; and

- c) the vehicles must be kept closed (such as through the use of a tarpaulin) at all times other than loading and unloading.

In order to verify that the radiation dose rate of the empty vehicles will not exceed the limits set forth in paragraph (a) above, and routine surveys to demonstrate compliance with this limit are not warranted, Mill Radiation Staff will verify (and document for the record) that this is the case by surveying a representative number of the initial vehicles as they are released from the Mill for return to the Mine. In performing such surveys, Mill Radiation Staff will follow existing Mill standard operating procedures.

It should be noted that, in order for vehicles to be released from the Mill site, Mill staff will also be required to survey the vehicles in accordance with the requirements of Nuclear Regulatory Commission Regulatory Guide 1.86 ("Reg. Guide 1.86"), unless and to the extent exempted by the Utah Division of Radiation Control. Reg. Guide 1.86 does not apply to releases of vehicles from the Mine site.

Unless the Transportation Contractor advises Mill staff otherwise, Mill staff will assume that each vehicle released from the Mill site will be returning to use solely for transporting uranium ore from the Mine to the Mill, and will not be released for unrestricted use.

The Transportation Contractor will advise Mill staff prior to sending any vehicle in for repairs or servicing, so that Mill staff can ensure that the vehicle to be serviced or repaired has been released for unrestricted use. No vehicle may be sent in for servicing or repair unless it has been released for unrestricted use by Mill staff.

8.3.2. Vehicles That Will Not be Used Solely for Transporting Ore From the Mine to the Mill (Free Release)

49 CFR 177.843 provides that each motor vehicle used for transporting uranium ores under exclusive use conditions in accordance with 49 CFR 173.427(c) must be surveyed with radiation detection instruments after each use. A vehicle may not be returned to service (i.e., released from the Mill for unrestricted release) until the radiation dose rate at every accessible surface is 0.5 mrem/hr or less and the removable (non-fixed) radioactive surface contamination is not greater than 2,200 dpm/100 cm², as required under 49 CFR 173.443(a).

As a result, if the Transportation Contractor advises Mill personnel that any particular vehicle will not be returning for use solely for purposes of transporting uranium ore from the Mine to the Mill or is to be sent in for servicing or repairs, Mill Radiation Safety staff will survey the vehicle prior to releasing it from the Mill site to ensure that it satisfies these criteria, as well as the applicable provisions of Reg. Guide 1.86. In performing such surveys, Mill Radiation Staff will follow existing Mill standard operating procedures.

Once a vehicle is surveyed for unrestricted release in accordance with this Section, Mill staff will remove or paint over the markings on the vehicle, described in Section 4 above.

9. Records

Records of all shipments will be maintained at the Mill office for at least 375 days or such longer period of time as may be required by applicable regulations.

10. Compliance With Laws

It is the responsibility of the Transportation Contractor to comply with all other applicable laws and regulations relating to the transportation of uranium ore from the Mine to the Mill that are not specifically mentioned in this procedure.